IN THE SPECIFICATION

Please amend the specification as follows:

Replace the paragraph on page 1, between lines 7-20 of the specification with the following:

The assessment of the blood volume of the left ventricle (LV) of the heart as a function of time is of importance for the evaluation of the pump function of the heart. Magnetic Resonance Imaging (MRI) is more and more getting accepted as the golden standard for this volume assessment because of its superior ~~spatio temporal~~ spatial-temporal and 'anatomical' resolution. Magnetic (MRI) is an imaging technique used primarily in medical settings to produce high quality images of the inside of the human body. MRI is based on the principles of nuclear magnetic resonance (NMR) and has advanced to a volume imaging technique. Slices having a defined slice thickness are composed of several volume elements or voxels. The volume of a voxel is calculated as the inplane resolution within the slice, e.g. 3 mm^2, multiplied with the through-plane resolution, i.e. the slice distance, e.g. 3 mm, which results in a

voxel volume of $3mm^3$ for the given example. The magnetic resonance image is composed of several picture elements called pixels. The intensity of a pixel is proportional to the NMR signal intensity of the contents of the corresponding volume element or voxel of the object being imaged.

Replace the paragraph on page 3, between lines 26-31 of the specification with the following:

- The intensity of blood significantly differs from that of the myocardium; for CT and MR blood is brighter than the myocardial tissue and the blood intensity is very strong, much stronger than that of myocardium or lung tissue, and of comparable intensity to any epicardial fat that may be present. In US and NM blood is usually dark and the myocardial tissue is brighter. Thus there is ~~a intensity~~ an intensity contrast between myocardial tissue and blood, independently from the imaging device/method used.

Replace the paragraph on page 5, between lines 16-18 of the specification with the following:

~~Fig. 8 is~~ Figs. 8-1 to 8-5 show a set of graphs illustrating

the variation of LV volume in different MR slices during a cardiac cycle calculated according to the method of the invention for six patients compared to manual delineated calculation of the whole sequence; and

Replace the paragraph on page 6, between lines 8-13 of the specification with the following:

Following this assumption, the blood volume at any subsequent phase in the cardiac cycle will be less than the blood volume at ED. Manual observation of the heart shows a tendency for the epicardial contour, i.e. the outer boundaries of the myocardium, to stay relatively fixed throughout the cardiac cycle, and the endocardial surface to move inwards, approximately towards the centroid of the left ventricular blood pool, as it approaches ES. This can be seen in the exemplary image sequence shown in ~~Fig. 4.~~ Figs. 4A-4B.

Replace the paragraph on page 6, between lines 24-31 of the specification with the following:

By means of endocardial delineation 21 and epicardial

delineation 20 for the first image in the cine series (approximately ED) the mean voxel intensity of myocardium 23 (between delineations 20,21) is calculated. This is shown in Figs. 2A and 2B in an exemplary MR image 200 (Fig. 2A) and a corresponding schematic illustration 201 (Fig. 2B) with the LV blood volume 22 inside the endocardial delineation 21. When the endocardial delineation 21 is copied and pasted to subsequent phases (as shown in Figs. ~~4a and 4B)~~ 4A and 4B) and the contained voxels are integrated, the integral is principally due to the intensities of the blood and the myocardium contained, that is:

Replace the paragraph on page 7, between lines 1-12 of the specification with the following:

Where I_T is the total signal intensity, I_B the signal intensity due to the blood and I_{MYO} the signal intensity due to any myocardium that is contained by the contour. As can be seen in Figs. 3A, 3B and Figs. 4A, 4B the endocardium moves towards the centroid of the LV blood volume. Fig. 3A is an exemplary MR image 300 (Fig. 3A) and a corresponding schematic illustration 301 is shown in Fig. 3B. The endocardium delineation at ES is delineated with the line 31

indicated in Figs. 3A and 3B. The LV blood pool at ES is shown at 32. The epicardium delineation 30 at ES is approximately the same as the epicardium delineation 20 at ED. Thus the contribution of the myocardium 23, 33 to the total intensity will increase from ED (image 41 in Fig. 4A) to ES (image 42 in Fig. 4A) and decrease from ES back to ED. Other contributions may arise from the lung, the right ventricular blood pool and epicardial fat. These will only occur if the heart moves sufficiently for these to be covered by the endocardial contour at subsequent phases.

Replace the paragraph on page 8 between lines 16-24 of the specification with the following:

V_{LV} is a function of time t and varies during the cardiac cycle as described above (maximum at ED, minimum at ES). Two examples of calculated $V_{LV}(t)$ are shown as continuous lines in Figs. 6 and 7. Therefore it is checked in step 54 of the method, if the LV volume has been calculated for all phases of the examined cardiac cycle from the MR cine series. Until all LV volumes for all phases are calculated, the method branches back to step 53, by increasing to the next phase slices in step 55 and calculating (in step 56) the

intensities within the copied ED endocardial delineation as described above. In this way the LV volume for all slices is summed up to a total LV volume for each phase, finally resulting in the total LV volume over the whole MR cine series as shown in the graphs in Figs. 6 and 7.

Replace the paragraph on page 9, between lines 6-16 of the specification with the following:

In order to verify the results, manual delineation was performed for every image and the number of voxels contained by that contour calculated. The number of voxels was multiplied by the volume of a single voxel to get a total endocardial volume for each image. The values of I_B were normalised to the endocardial volume in order for them to be plotted on the same axes, by calculating the factor that forces the integral value for the first image to coincide with the volume contained by the manual delineation for that image. This factor was then applied to the intensity sums of all of the images of that slice. Graphs of the values produced can be seen in ~~Fig. 8~~ Figs. 8-1 to 8-5. These ~~traces,~~ traces follow their manually derived counterparts very well. The smooth nature of

the intensity derived traces suggest a more plausible description of cardiac function than the ragged manually derived traces, which is due to the inherent error present in manual delineations.

Replace the paragraph on page 9, between lines 17-18 of the specification with the following:

The graphs in Figs. 6 to 8-5 show similar shape and features to the volumes produced by the manual delineations.